

## WHAT IS CLAIMED IS:

1. A transmitter comprising:
  - an input-side digital multi-port directional coupler for dividing and combining digital transmission signals of N channels by digital processing and for outputting N-channel signals to N transmission channels, respectively;
  - 5 predistorters inserted in said N transmission channels, respectively, for linearizing said N transmission channels;
  - transmitting parts inserted in said N transmission channels, respectively, for converting output signals from said predistorters to high-frequency signals
  - 10 of said N channels; and
  - an output-side multi-port power combiner for dividing and combining said high-frequency signals of said N-transmission channels to output high-frequency transmission signals for said N transmission channels.
2. The transmitter of claim 1, which further comprises receiving parts  
15 of said N channels for extracting distortion components from said high-frequency signals of N channels and for generating, based on said distortion components, compensating signals which control said linearization by said predistorters of N channels, and wherein, based on said compensating signals, said predistorters of N channels generate compensating distortions for  
20 canceling nonlinear distortions by said N transmission channels and impart said compensating distortions to signals of N channels, respectively.
3. The transmitter of claim 2, wherein said predistorters of N channels are digital predistorters of N channels for imparting said compensating distortions to said signals of N channel by digital processing, and which further  
25 comprises: digital-to-analog converters of N channels for converting the outputs from said predistorters of N channels to analog signals of N channels and for applying said analog signals of N channels to said transmitting parts of

N channels, respectively; and digital-to-analog converters of N channels for converting said compensating signals from said receiving parts of N channels to digital compensating signals and for applying said digital compensating signals to said digital predistorters of N channels.

5       4. The transmitter of claim 2, wherein said predistorters of N channels are analog predistorters, and which further comprises digital-to-analog converters of N channels for converting said signals of N channels output from said input side digital multi-port directional coupler to analog signals for application to said digital predistorters of N channels, said receiving parts of N  
10      channels providing said compensating signals to said digital predistorters.

5       5. The transmitter of claim 3 or 4, wherein each of said transmitting parts of N channels includes: an up-converting part for the corresponding one of said signals of N channels to a high-frequency signal of the transmission frequency band; and a power amplifier for amplifying the power of said  
15      high-frequency signal and for applying said power-amplified high-frequency signal to said output side multi-port directional coupler.

6. The transmitter of claim 3 or 4, wherein each of said receiving parts of N channels includes: a detecting part for detecting the corresponding one of said high-frequency signals of N channels; a band-pass filter for extracting a  
20      distortion component by said power amplifier from said detected output; and a control part for generating said compensating signal based on said distortion component.